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effects (but by no means all of them certain) upon national character. The most tangible are the creation of earthquake gods or monsters, and the introduction of their cults. In the second paper the question of animal foreknowledge of such phenomena is discussed. When the animal's agitation precedes the shock by some time it has nothing to do with it, but when by only a half minute or less the animal may feel the fainter ripples that run before the main waves in heavy earthquakes. Under favorable circumstances the shock may thus be anticipated as much as 10 or 15 seconds by human observers.

*Vollständiges Lehrbuch der Gedächtniskunst.* ADOLF KÜHNE. Osterwieck, Harz.

*Die Gedächtniskunst im Dienste des Lehrenden und Lernenden.* J. FIEWEGER. Breslau, 1888.

A. Kühne bases his art upon the laws of association and the principle that the learner should proceed from the known to the unknown. He approves what Kant called the *judiciöse* method in mnemonics, and maintains that without the help of the understanding the memory is always weak and untrustworthy. He adopts a figure alphabet, associates the fact to be remembered with the mnemonic word after the fashion of some of the older mnemonic teachers, and applies his principles chiefly to the learning of dates, tables and the like.

J. Fieweger gives many illustrations of the application of the older principles of the mnemonic art in learning difficult tasks. Such books are chiefly interesting psychologically as showing the cumbersome devices that some people find helpful for forcing the attention to disagreeable things.

W. H. B.

*Beiträge zur Kenntniss der Physiologie und Biologie der Protozoen.*  
Bericht der naturforschenden Gesellschaft zu Freiburg, Vol. I, 1886.

This paper is of great psychological as well as of biological interest. It was found that when these unicellular organisms (*Stentor*, *Amoeba*, etc.) were artificially cut up, that the part cut off was restored to its perfect form by regeneration, no matter what was the portion of the cell that was lost; so that when the cell was divided two or more times into approximately equal parts, each part restored itself to the perfect animal. It was found that no portion would thus restore itself unless it possessed a fragment of the nucleus (which in *Stentor* is a long-headed filament). The conclusion is plain, viz. that any portion of the nucleus possesses protoplasm which has the complete characters of the entire being, and which controls the nutrition of the extra-nuclear protoplasm. That is, the molecules of the nucleus are *idioplasm*, and each is like the others, and in itself is capable of restoring the entire cell. These idioplasm molecules may of course be different from chemical molecules; experiments throw no light on that. Partial or incomplete division leads to the formation of individuals that remain united by the part left uncut. Studies of the spontaneous fission of these forms revealed that the daughter-cells of one form divided together, although separated into different watch-crystals and in different sorts of water. This same synchronism of reproductive activity of protoplasm closely related, was observed in the artificial sections, even when these differed greatly as to size.

J. N.